

**REMARKS**

Claims 17-27, 29 and 31 were pending. Claim 17 has been amended herein. No new matter has been added. No fee for additional claims is due by way of this Amendment. The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090. Claims 17-27, 29 and 31 therefore remain pending for examination.

**Rejection of Claims 17-27, 29 and 31 under 35 U.S.C. § 112, Second Paragraph**

The Office Action rejected all of the pending claims as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. In particular, the Examiner requested that Applicants clarify whether the compound described in previously pending claim 17 referred to “a chemical compound or compounding in the general sense.” Office Action, p. 2. In order to address the Examiner’s concern, Applicants have amended claim 17 to recite “a chemical compound.” Applicants note that this amendment has not been made for patentability purposes, as it is believed that the claims would satisfy the statutory requirements for patentability without the entry of the amendment.

**Rejection of Claims 17-27, 29 and 31 under 35 U.S.C. § 112, First Paragraph**

The Office Action also rejected all of the pending claims for failing to comply with the written description requirement. In particular, the Examiner asked that Applicants point out where a basis in the specification can be found for the claimed recording layer containing “the at least one element selected from the group consisting of S, O, C and N and the at least one metal different from the element M and selected from the group consisting of Mg, Al and Ti in a form of a chemical compound thereof.” Applicants submit that support for this claim language can be found throughout the originally filed specification, including at p. 31, l. 18 to p. 32, l. 3. This passage in the specification recites:

Further, the second recording layer 30 having a thickness of 15 nm to 50 nm is formed on the surface of the first intermediate layer 12 by a vapor growth process such as a sputtering process using a target consisting of the mixture of ZnS and SiO<sub>2</sub> and a target consisting of at least one

metal selected from the group consisting of Mg, Al and Ti. During the process for forming the second recording layer 30, the at least one metal selected from the group consisting of Mg, Al and Ti acts on the mixture of ZnS and SiO<sub>2</sub> as a reducing agent and as a result, Zn is separated from S and simple substances of Zn are uniformly dispersed in the second recording layer 30.

On the other hand, although not altogether clear, it is reasonable to conclude that the at least one metal selected from the group consisting of Mg, Al and Ti combines a part of S separated from Zn or S contained in ZnS to form a compound.

This passage, in combination with the other teachings of the originally-filed specification, clarifies the chemical compounds that are formed in at least one of the recording layers other than a recording layer farthest from the light transmission layer from at least one element selected from the group consisting of S, O, C and N and at least one metal different from the element M and selected from the group consisting of Mg, Al and Ti. Withdrawal of the rejections of the claims under 35 U.S.C. § 112, first paragraph is therefore requested.

**Rejection of Claims 17-25 and 31 under 35 U.S.C. § 103(a)**

The Office Action rejected claims 17-25 and 31 under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent no. 6,033,752, issued to Suzuki *et al.* ("Suzuki"), and U.S. patent no. 4,405,706, issued to Takahashi *et al.* ("Takahashi"), in view of Japanese publication no. JP 54-133134, to Yoshiyuki ("Yoshiyuki"). These rejections are respectfully traversed because Suzuki, alone or in combination with Takahashi and Yoshiyuki, fails to disclose, teach or suggest all of the elements of the claims. *See* M.P.E.P. § 2143.03 (stating that all words in a claim must be considered in judging the patentability of that claim against the prior art).

Independent claim 17 recites, *inter alia*, an "optical recording medium comprising a substrate, a light transmission layer, and a plurality of recording layers laminated via at least intermediate layers and disposed between the light transmission layer and the substrate, the recording layers constituted so that a laser beam is projected onto the plurality of recording layers via the light transmission layer, at least one of the recording layers other than a recording layer farthest from the light transmission layer among the plurality of recording layers containing at least one element M selected from a group consisting of Ni, Cu, Si, Ti, Ge, Zr, Nb, Mo, In, Sn, W, Pb, Bi, Zn and La, at least one element selected from a group consisting of S, O, C and N as a

primary component, and at least one metal different from the element M and selected from a group consisting of Mg, Al and Ti . . . wherein the at least one element selected from the group consisting of S, O, C and N and the at least one element M are combined upon being irradiated with the laser beam to form a crystal of a chemical compound thereof, thereby recording information in the at least one recording layer.” (Emphasis added.)

#### The Plurality of Recording Layers

Claim 17 recites an optical recording medium having a plurality of recording layers constituted so that a laser beam is projected onto the plurality of recording layers via a single light transmission layer. The Office Action states that “the claims do not require that all the recording layers be accessible from the same side.” Office Action, p. 8. However, Applicants respectfully submit that at least the claimed plurality of recording layers are, in fact, constituted so that a laser beam may be projected onto them via the same light transmission layer. Such a configuration is not taught or suggested by the combination of Suzuki, Takahashi, and Yoshiyuki.

The Office Action asserts that it would have been obvious to adhere recording media together as shown in Figure 4 of Suzuki in order to arrive at an optical recording medium having the claimed plurality of recording layers. However, Suzuki merely discloses “a double sided optical recording medium 12.” Col. 9, l. 32. While this double sided recording medium disclosed by Suzuki includes multiple recording bi-layers, these bi-layers are not constituted so that a laser beam may be projected onto the plurality of recording bi-layers via a single light transmission layer. Instead, Suzuki’s optical recording medium is double-sided and therefore includes two light transmission layers, one for each recording bi-layer. Thus, Suzuki does not disclose, teach or suggest the claimed plurality of recording layers.

The Office Action does not suggest that Takahashi or Yoshiyuki supply this teaching of a plurality of recording layers constituted so that a laser beam is projected onto the plurality of recording layers via a single light transmission layer, and Applicants submit that neither Takahashi nor Yoshiyuki disclose, teach or suggest the claimed plurality of recording layers.

Moreover, since none of the cited references teaches the claimed plurality of recording layers, none of the cited references can be used to teach the composition of “at least one of the recording layers other than a recording layer farthest from the light transmission layer among the plurality of recording layers.” Indeed, none of the cited references discloses a recording layer other than a recording layer farthest from a light transmission layer.

Irradiated with the Laser Beam to Form a Crystal of a Chemical Compound

Claim 17 further recites that the at least one of the recording layers other than a recording layer farthest from the light transmission layer has at least one element selected from the group consisting of S, O, C and N and at least one element M combined upon being irradiated with a laser beam to form a crystal of a chemical compound. Such a recording layer is not taught by the combination of Suzuki, Takahashi, and Yoshiyuki.

As is recognized in the Office Action, Suzuki teaches a recording bi-layer, wherein a component of one layer (*e.g.*, Bi/ZnS/SiO<sub>2</sub>) mixes or reacts with a component of another layer (*e.g.*, In) upon being irradiated with a laser beam to form an intermetallic compound or a semiconductor, thus reducing the metallic properties of one of the components. *See* col. 7, l. 62 – col. 8, l. 19. Suzuki does not, however, disclose, teach, or suggest that any components may combine upon being irradiated with a laser beam to form a crystal of a chemical compound, let alone at least one element selected from the group consisting of S, O, C and N and the at least one element M.

Takahashi, in turn, teaches the use of a heat mode recording layer that, when irradiated, experiences a local temperature increase, causing a thermal change such as melting cohesion or evaporation. *See* col. 1, ll. 16-26. Takahashi too, therefore, does not disclose, teach or suggest components that combine upon being irradiated with a laser beam to form a crystal of a chemical compound, let alone at least one element selected from the group consisting of S, O, C and N and the at least one element M.

Finally, Yoshiyuki teaches recodation by irradiating an oxidant 2 to release the oxygen therein, thereby oxidizing a metal oxide 1 and rendering the metal oxide 1 transparent. *See* Figure 2. Yoshiyuki, therefore, does not disclose, teach or suggest components that combine upon being irradiated with a laser beam to form a crystal of a chemical compound, let alone at

least one element selected from the group consisting of S, O, C and N and the at least one element M.

Differences between the Cited References Would Deter a Skilled Artisan from Making the Combination

As described above, the three references cited by the Examiner teach recording layers having different compositions for recording data by very distinct and different processes. In particular, Suzuki teaches a recording bi-layer, wherein a component of one layer (e.g., Bi/ZnS/SiO<sub>2</sub>) mixes or reacts with a component of another layer (e.g., In) upon being irradiated with a laser beam to form an intermetallic compound or a semiconductor, thus reducing the metallic properties of one of the components. See col. 7, l. 62 – col. 8, l. 19. Takahashi teaches the use of a heat mode recording layer that, when irradiated, experiences a local temperature increase, causing a thermal change such as melting cohesion or evaporation. See col. 1, ll. 16-26. Finally, Yoshiyuki teaches recordation by irradiating an oxidant 2 to release the oxygen therein, thereby oxidizing a metal oxide 1 and rendering the metal oxide 1 transparent. See Figure 2.

These inherent differences between the mixing process of Suzuki, the melting/evaporation process of Takahashi, and the oxidation process of Yoshiyuki would deter a person skilled in the art from making the combination suggested by the Examiner. The Examiner ignores the fact that each of the references discloses particular materials suitable for specific processes that are not intended for use with one another. Indeed, a person skilled in the art would understand that there would be significant technical challenges in attempting, for example, to apply teachings regarding the use of the heat mode recording layer of Takahashi to the recording bi-layers of Suzuki, which might render Suzuki unsuitable for its intended purpose, i.e., recording via a particular process. The Examiner fails to recognize and properly consider the technical problems with the asserted combination and simply applies hindsight reasoning to support the combination.

For at least the above reasons, it is respectfully submitted that the Office Action has not presented a prima facie case of obviousness for claim 17 over the Suzuki, Takahashi, and Yoshiyuki references.

**Rejection of Claims 17-27 and 31 under 35 U.S.C. § 103(a)**

The Office Action also rejected claims 17-27 and 31 under 35 U.S.C. § 103(a) as being unpatentable over Suzuki and Takahashi, in view of Yoshiyuki, and further in view of U.S. patent no. 4,682,321, issued to Takaoka *et al.* (“Takaoka”) or Japanese publication no. JP 2003-054135, to Mizushima *et al.* (“Mizushima”) combined with U.S. patent application publication no. 2004/0018334, to Nee (“Nee”) and U.S. patent no. 5,871,881, issued to Nishida *et al.* (“Nishida”). These rejections are respectfully traversed because the cited references fail to disclose, teach or suggest all of the elements of the claims. *See* M.P.E.P. § 2143.03 (stating that all words in a claim must be considered in judging the patentability of that claim against the prior art).

As set forth above, Suzuki, Takahashi and Yoshiyuki do not, alone or in combination, supply any teaching regarding the composition of at least one of a plurality of recording layers other than a recording layer farthest from the light transmission layer. Indeed, none of these references discloses a recording layer other than a recording layer farthest from a light transmission layer. Thus, even if more recording layers were added in accordance with the additional references cited by the Examiner, such additional recording layers cannot supply this missing teaching of Suzuki, Takahashi and Yoshiyuki.

Moreover, Suzuki, Takahashi and Yoshiyuki do not, alone or in combination, teach at least one of the recording layers other than a recording layer farthest from the light transmission layer having at least one element selected from the group consisting of S, O, C and N and at least one element M combined upon being irradiated with a laser beam to form a crystal of a chemical compound. The Office Action does not suggest that the additional cited references supply this teaching.

Finally, as described above, Suzuki, Takahashi and Yoshiyuki are not properly combinable in light of the technical differences between these references. The additional references cited by the Examiner do not provide any additional reason or motivation that would lead a person skilled in the art to combine these references.

For at least the above reasons, it is respectfully submitted that the Office Action has not presented a *prima facie* case of obviousness for claim 17 over the Suzuki, Takahashi, Yoshiyuki, Takaoka, Mizushima, Nee and Nishida references.

**Rejection of Claims 17-27, 29 and 31 under 35 U.S.C. § 103(a)**

The Office Action further rejected claims 17-27, 29 and 31 under 35 U.S.C. § 103(a) as being unpatentable over Suzuki and Takahashi, in view of Yoshiyuki, and further in view of Takaoka or Mizushima combined with Nee and Nishida, combined with U.S. patent application publication no. 2001/0021160, to Shuy *et al.* ("Shuy"). These rejections are respectfully traversed because Shuy does not provide teachings that remedy the above-described defects in the obviousness rejections over the Suzuki, Takahashi, Yoshiyuki, Takaoka, Mizushima, Nee and Nishida references.

For at least the above reasons, it is respectfully submitted that the Office Action has not presented a *prima facie* case of obviousness for claim 17 over the Suzuki, Takahashi, Yoshiyuki, Takaoka, Mizushima, Nee, Nishida and Shuy references.

Claims 18-27, 29 and 31 depend from independent claim 17 and are allowable as depending from an allowable base claim, as well as for the novel and non-obvious combinations of elements recited therein.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

All of the claims remaining in the application are now clearly allowable.  
Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,  
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